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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,316	12/28/2001	Marc R. Amling	02580- P0030A	9649
24126	7590	10/18/2005		
ST. ONGE STEWARD JOHNSTON & REENS, LLC 986 BEDFORD STREET STAMFORD, CT 06905-5619				
EXAMINER DURNFORD GESZVAIN, DILLON				
ART UNIT		PAPER NUMBER		
2615				

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/033,316

Applicant(s)

AMLING ET AL.

Examiner

Dillon Durnford-Geszvain

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities: in line 7 of paragraph [0034] "105" should be --405--. In line 4 of paragraph [0030] "also provides and input" should be --also provides an input--.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims **15, 18, 34, 36** and **42** are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,449,007 (Yokoyama).

As to claim **15**, Yokoyama teaches a video imaging system comprising: a camera control unit 10 for processing an image signal; a cable 8, connected to said camera control unit 10, for transmitting the image signal to said camera control unit; and a camera head 9, connected to said cable 8, for providing the image signal, said camera

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head 9 including: an imager 61, for generating the image signal; and a timing generator 64, for actuating said imager (Column 4 lines 23-35).

As to claim **18**, see the rejection of claim **15** and note that Yokoyama further teaches a serializer, for serializing the image signal.

Note that the serializer is not shown explicitly but is taught implicitly as the image data from the CCD imager 61 is brought out of the camera head 9 in a timewise manner over a single line (Column 3 lines 1-3). Therefore the circuitry that is used in the camera head must perform the function of a serializer.

As to claim **19**, see the rejection of claim **15** and note that Yokoyama further teaches the video imaging system according to claim **15** wherein said camera head further comprises a processor 1 (Column 4 lines 36-37).

As to claim **34**, Yokoyama teaches a video imaging system comprising: a camera control unit 10 for processing an image signal; a cable 8, connected to said camera control unit 10, for transmitting the image signal to said camera control unit 10; and a camera head 9, connected to said cable 8, for providing the image signal, said camera head 9 including: an imager 61, for generating an image signal; and a serializer, for serializing the image signal for transmission over said cable (Column 4 lines 23-35).

See the note for claim **15** above in regard to the serializer.

As to claim **36**, see the rejection of claim **34** and note that Yokoyama further teaches the camera head contains a processor 1 (Column 4 lines 36-37).

As to claim **42**, Yokoyama teaches a video imaging system comprising: a camera control unit 10 for processing an image signal; a cable 8, connected to said camera control unit 10, for transmitting the image signal to said camera control unit 10; and a camera head 9, connected to said cable 8, for providing the image signal, said camera head including: an imager 61, for generating the image signal; and a processor 1 (Column 4 lines 23-35).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **1, 3, 16, 25** and **27** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.).

As to claim **1**, Yokoyama teaches a video imaging system comprising: a camera control unit 10 for processing a digital image signal; a cable 8, connected to said camera control unit 10, for transmitting the digital image signal to said camera control

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unit 10; and a camera head 9, connected to said cable 8, for providing the digital image signal, said camera head including: an imager 61, for generating an analog image signal; a timing generator 64, for actuating said imager 61; and a serializer, for serializing the digital image signal for transmission over said cable.

Note that the serializer is not shown explicitly but is taught implicitly as the image data from the CCD imager 61 is brought out of the camera head 9 in a timewise manner over a single line (Column 3 lines 1-3). Therefore the circuitry that is used in the camera head must perform the function of a serializer.

What Yokoyama does not teach is a converter for converting the analog image signal to a digital image signal (an analog to digital converter or A/D converter) in the camera head, however it does teach an A/D in the signal processing unit 10. Koide et al teaches an A/D converter 103 in an image sensor 11 which is connected to a computer 12. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have moved the A/D converter of Yokoyama from the signal processing portion 10 to the camera head portion 9 as the signals would then be converted to digital signals before being transmitted over the cable 8 which reduces the effect of noise on the signal.

As to claim 3, see the rejection of claim 1 and note that Yokoyama further teaches the video imaging system according to claim 1 wherein said camera head 9 further comprises a processor 1 (Column 4 lines 36-37).

As to claim **16**, see the rejection of claim **15** and note that Yokoyama does not teach an analog to digital converter in the camera head. However, Koide et al. teaches converting an image signal using an analog to digital converter 103 before it is transmitted from an image sensing unit 11 to a computer 12. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have moved the analog to digital converter of Yokoyama from the CCU to the camera head as it is arranged in Koide et al. as this would make the signal more resistant to noise when it is transmitted from the camera head to the CCU.

As to claim **25**, Yokoyama teaches a video imaging system comprising: a camera control unit 10 for processing a digital image signal; a cable 8, connected to said camera control unit 10, for transmitting the digital image signal to said camera control unit 10; and a camera head 9, connected to said cable 8, for providing the digital image signal, said camera head 9 including: an imager 61, for generating an analog image signal (Column 4 lines 23-35).

What Yokoyama does not teach is the camera head including a converter for converting the analog signal into a digital image signal. However, as discussed above in the rejection of claim **16** Koide et al. teaches an analog to digital converter 103 in an image sensing unit 11 that converts the image data to digital image data before it is transmitted to a computer 12. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have moved the analog to digital

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converter of Yokoyama from the CCU 10 to the camera head 9 as taught by Koide et al. as converting the image data from analog to digital before transmission makes the signal more resistant to noise as digital signals are more resistant to noise than are analog signals.

As to claim 27, see the rejection of claim 25 and note that Yokoyama further teaches a serializer, for serializing the digital image data.

See the note for the rejection of claim 15.

As to claim 28, see the rejection of claim 25, and note that Yokoyama further teaches the video imaging system according to claim 25 wherein said camera head 9 further comprises a processor 1 (Column 4 lines 36-37).

7. Claims 2 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.) as applied to claim 1 or claim 25 respectively further in view of US 6,573,931 (Horii et al.).

As to claim 2, see the rejection of claim 1 and note that what neither Yokoyama nor Koide et al. teaches is a multiplexer contained in a camera head which transmits a multiplexed signal including image data and control data. However, Horii et al. teaches a camera head 150 containing a multiplexer 115 for transmitting a multiplexed signal containing image data and control data (Column 2 lines 1-5).

Therefore it would have been obvious to one of ordinary skill in the art at the time



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the invention was made to have added the multiplexer taught by Horii et al. to the video imaging system taught by Yokoyama in view of Koide et al. as this would allow for using less wires and would allow for a smaller cable.

As to claim **26**, see the rejection of claim **25** and note that what neither Yokoyama nor Koide et al. teach is a multiplexer for generating a multiplexed signal, which includes a digital image signal and control signals. However, as discussed in the rejection of claim **2** above, Horii et al. teaches a camera head 150 with a multiplexer 115 for transmitting a multiplexed signal containing image data and control data (Column 2 lines 1-5).

8. Claims **4-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.) as applied to claim **1** and claim **3** further in view of US 6,638,212 (Oshima).

As to claim **4**, see the rejection of claim **3** and note that what Yokoyama and Koide et al. teach has been discussed above. What neither Yokoyama nor Koide et al. teach is a memory device contained in the camera head and accessible by the processor containing camera head information. However, Oshima teaches an endoscope having a nonvolatile memory 20, contained in the camera head 2 and accessible by processor 21, containing camera head information (Column 6 lines 60-63). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added a nonvolatile memory containing camera head

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information as taught by Oshima to the camera head taught by Yokoyama in view of Koide et al. as this would allow the camera head to store such information as the make and model as well as how many times it has been used and who used it.

As to claim **5**, see the rejection of claim **1** and note that what Yokoyama and Koide et al. teach has been discussed above. What neither teaches is formatting the camera control unit with inputted data. However, Oshima teaches formatting the way that the camera control unit reads the data according to inputted data (Column 29 lines 16-25). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the function of changing the camera control unit settings according to inputted data as taught by Oshima to the video imaging apparatus taught by Yokoyama in view of Koide et al. as this would allow an endoscope to be quickly formatted to read data from a camera head correctly without trial and error.

As to claim **6**, see the rejection of claim **5** and note that Oshima further teaches the inputted data coming from the camera head (Column 29 lines 16-25).

9. Claims **29-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.) as applied to claim **25** and claim **28** further in view of US 6,638,212 (Oshima).

As to claim **29**, see the rejection of claim **28** and note that what neither Yokoyama nor Koide et al. teach is the camera head including a memory device,

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accessible by the processor, containing camera head information. However, as discussed in the rejection of claim 4, Oshima teaches a memory 20 storing camera head information (Column 6 lines 60-63). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the memory of Oshima to the system taught by Yokoyama in view of Koide et al. as this would allow the camera head to store such information as the make and model as well as how many times it has been used and who used it.

As to claims 30 and 31, see the rejection of claim 25 and note that neither Yokoyama nor Koide et al. teaches is a video imaging system wherein data inputted from the camera head formats the camera control unit. However, as discussed in the rejection of claim 5, Oshima teaches formatting a CCU with data inputted from a camera head (Column 29 lines 16-25).

10. Claims 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.) as applied to claim 1 further in view of US 6,836,290 (Chung et al.).

As to claim 7, see the rejection of claim 1 and note that Yokoyama and Koide et al. have been discussed above. What neither teaches is using digital serial drivers to transmit data from a camera head to a camera control unit. However, Chung et al. teaches an imager utilizing at least one digital serial driver 54 (Column 2 lines 28-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time

the invention was made to have used the digital serial driver taught by Chung et al. to transmit signals in the system taught by Yokoyama in view of Koide et al. as this is a low power system that allows for the use of differential signals that are resistant to EMI noise.

As to claim 8, see the rejection of claim 1 and note that Yokoyama and Koide et al. have been discussed above. What neither teaches is using digital serial receivers to receive data from a camera control unit at a camera head. However, Chung et al. would have considered using a receiver 56 in a camera head if two way communication between the camera head and camera control unit was desired instead of one way communication between an imager and an image processor.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a receiver as taught by Chung et al. in the camera head as taught by Yokoyama in view of Koide et al. as this would provide a lower power and noise resistant form of communication.

As to claim 9, see the rejection of claim 7 and note that Chung et al. further teaches the driver 54 utilizing Low-Voltage Differential Signals (LVDS) (Column 2 lines 27-37).

As to claim 10, see the rejection of claim 8 and note that Chung et al. teaches the receiver 56 utilizing LVDS (Column 2 lines 27-37).

As to claim 11, see the rejection of claim 1 and note that Yokoyama and Koide et al. have been discussed above. What neither teaches is using a digital serial driver in the camera control unit. However, Chung et al. teaches using digital serial drivers and receivers to communicate between an imager and an image processor. If two-way communication were desired, Chung et al. would have considered using digital serial drivers to communicate both ways. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the digital serial drivers taught by Chung et al. to perform communication between the camera control unit of Yokoyama in view of Koide et al. as it is a low power noise resistant form of communication. This would include both communication from the camera head to the camera control unit and from the camera control unit to the camera head.

As to claim 12, see the rejection of claim 1 and note that Chung et al. teaches an image processor with at least one digital serial receiver for receiving signals from an imager (Fig. 4 and Column 2 lines 27-37). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a receiver similar to that taught by Chung et al. in the system taught by Yokoyama in view of Koide et al. as it is a low power communication method that is resistant to noise from EMI.

As to claim 13, see the rejection of claim 11 and note that Chung et al. further teaches digital serial drivers utilizing LVDS.

As to claim **14**, see the rejection of claim **12** and note that Chung et al. further teaches digital serial receivers utilizing LVDS.

11. Claims **32-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,870,566 (Koide et al.) as applied to claim **25** further in view of US 6,836,290 (Chung et al.).

What Yokoyama and Koide et al. teach has been discussed above. What they don't teach is digital serial receivers and drivers using LVDS as the means for communicating between the camera head and the CCU. However, as discussed in the rejection of claims **7-14** above, Chung et al. teaches using digital serial drivers and receivers utilizing LVDS to communicate between an imager and an image processor (Column 2 lines 27-37).

12. Claims **17** and **35** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,573,931 (Horii et al.).

As to claim **17**, see the rejection of claim **15** and note that what Yokoyama does not teach is a multiplexer for generating a multiplexed signal including an image signal and a control signal. As discussed above in the rejection of claim **2**, Horii et al. teaches a multiplexer for creating a multiplexed signal containing image data and control data. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the multiplexer taught by Horii et al. into the

system taught by Yokoyama as this would allow the cable to be thinner as only one line would need to pass through it.

As to claims **35** and **44**, see the rejection of claims **34** and **42** respectively and note that the limitations in claims **35** and **44** are analogous to the limitations in claim **17** and claim **2**; therefore as stated above it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the multiplexer taught by Horii et al. to the camera head taught by Yokoyama as this would allow for less wires which would make the cable smaller.

13. Claims **20-22**, **37-39**, **43** and **45-46** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,638,212 (Oshima).

As to claim **20**, **37** and **43**, see the rejections of claims **19**, **36** and **42** respectively and note that what Yokoyama does not teach is a memory device, accessible by said processor, containing camera head information. However, as discussed in the rejection of claim **4**, Oshima teaches a non-volatile memory **20** contained in camera head **2** and accessible by processor **21** containing camera head information (Column 6 lines 60-63).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added a memory containing camera head information to the camera head taught by Yokoyama as this would allow the make, model, number of times used and other such information to be easily accessed by a CCU which would

allow the settings to be automatically set for the specific head being used.

As to claims **21, 38** and **45**, see the rejection of claims **15, 34** and **42** respectively and note that what Yokoyama does not teach an inputting data to format the camera control unit. However, as discussed in the rejection of claim **5**, Oshima teaches formatting a CCU according to data inputted from a camera head (Column 29 lines 16-25). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formatted a CCU using data inputted from an outside source such as a camera head as this would allow the settings to optimized for the camera head being used and would eliminate the need for a user to input all of the settings every time a different camera head is used which would save time.

As to claims **22, 39** and **46**, see the rejection of claims **21, 38** and **45** respectively and note that, as discussed above, Oshima teaches the inputted data coming from the camera head (Column 29 lines 16-25).

14. Claims **23, 24, 40, 41, 47** and **48** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,449,007 (Yokoyama) in view of US 6,836,290 (Chung et al.).

Yokoyama does not teach using serial drivers and receivers utilizing LVDS as the means for transmitting signals. However, Chung et al. teaches sending signals with a digital serial driver 54 on an imager 50 to a digital serial receiver 56 in an image processor 52 using LVDS. Therefore it would have been obvious to one of ordinary skill



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in the art at the time the invention was made to have used digital serial drivers and receivers utilizing LVDS to transmit signals from the camera head to the CCU as LVDS is resistant to EMI and is a low power method of sending signals.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,219,091 (Yamanaka et al.) teaches an endoscope having a processor, timing generator, memory and analog to digital converter in the camera head. US 6,390,972 (Speier et al.) teaches an endoscope with a conductive inner chamber to protect the imager and cable from electro-magnetic interference. US 6,707,490 (Kido et al.) teaches a digital camera with a camera head having a processor, analog to digital converter, timing generator and memory.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon Durnford-Geszvain whose telephone number is (571) 272-2829. The examiner can normally be reached on Monday through Friday 8 am to 5 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dillon Durnford-Geszvain

10/5/2005



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